The Timing Ability of Newly Listed NYSE Firms, 1926-1962

Tim Loughran
Mendoza College of Business
University of Notre Dame
Notre Dame, IN 46556-5646
loughran.9@nd.edu
(574) 631-8432

and

Jennifer Marietta-Westberg*
Michigan State University
Department of Finance
312 Eppley
East Lansing, MI 48824-1121
mariettaj@bus.msu.edu
(517) 353-1894

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Abstract

We demonstrate that during the period 1926 to 1962, the number of new listings on the New York Stock Exchange has predictive ability for future aggregate market returns. The forecasting power of new listings is evident even after controlling for previously documented market predictors, such as the dividend yield. While firms do not appear to time their own performance, tests investigating aggregate market movements around new listing dates are consistent with a forecasting ability of the new listing variable. In particular, nonparametric regression methods are used to determine the functional relationship between one-year post market returns and new listings. We find a decreasing trend in the expected one-year post market return as a function of the number of new listings each quarter. Subsequent tests show that mean reversion in market returns does not drive the predictive evidence found in the paper.

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The explanation of market anomalies accounts for a substantial portion of research in finance. In particular, research on long-run anomalies is increasingly prevalent in the literature, examining such areas as initial public offerings (IPOs), seasoned equity offerings (SEOs), share repurchases, cash flows, and private placements of equity.[1] A consistent focus of the anomaly literature is the prospect of managers timing their *own firm's* performance. The long-term performance of a group of firms is linked to managers undertaking particular corporate events when it is most advantageous for the firm. We extend this area of research by examining the long-run performance of new listings on the New York Stock Exchange (NYSE) during the 1926 to 1962 period using more "modern" techniques. NYSE new listings during this period are overwhelmingly composed of firms switching from regional exchanges. A small portion of the sample contains initial public offerings.[2]

This paper also addresses an area of the literature that examines corporate events and their timing ability for future *aggregate market* returns. For example, Loughran, Ritter, and Rydqvist (1994) show that IPO firms have some market timing ability. They note that when IPO volume is high, future market returns tend to be low. Baker and Wurgler (2000) show that their equity share model predicts market returns that are

[1] See Brav, Geczy, and Gompers (2000), Loughran and Ritter (1995), Mitchell and Stafford (2000), Lerner (1994), and Spiess and Affleck-Graves (1995) for IPOs and/or SEOs; Ikenberry, Lakonishok, and Vermaelen (1995) for share repurchases; Houge and Loughran (2000) for cash flows; and Hertzel, Lemmon, Linck, and Rees (2002) for private placements of equity.

[2] McConnell and Sanger (1987) try to establish the prior-trading locale of the newly listed firms in their sample from 1926 through 1982. By examining such sources as the *Bank and Quotation Record*, the *Commercial and Financial Chronicle* and the *Wall Street Journal*, they document that the number of initial public offerings in the sample is relatively small.

sometimes significantly negative. They conclude that managerial timing of an inefficient equity market is the most credible explanation for their results. Hand and Skantz (1999) find that equity carve-outs correlate with peaks in an overvalued stock market. They also show that carve-outs are contrarian predictors of future one-year market returns, even after controlling for rational determinants of future returns. This paper advances the literature by analyzing the predictive ability of new listings on the NYSE for future market returns.

The paper makes three major contributions. First, we provide evidence that managers exhibit aggregate market timing ability in choosing when to list their firm on the NYSE. Managers appear to take advantage of favorable market conditions, deciding to newly list their firms before downturns in the market.

We also introduce the econometric techniques of nonparametric regression and cross validation to this area. These methods document timing ability by showing that as the number of new listings per quarter rises, the expected one-year post market return declines. Our final contribution documents the predictive ability of the new listing variable. Both the number and the percentage of new listings (as a portion of all firms listed on the NYSE) show forecasting ability for market returns, even after controlling for other predictors already documented in the literature, such as the term spread and default premium.

The choice of examining the 1926 to 1962 period is twofold. First, our major reason concerns the analysis of our timing hypothesis. During this period the New York Stock Exchange is the only major exchange on which firms may list. Prior new listing research uses samples that include more than one major stock exchange: the NYSE and

Amex or the NYSE, Amex and Nasdaq. Simultaneously examining firms that can choose to switch to multiple major exchanges can obscure the analysis because of the various market microstructures and different listing requirements of each exchange.

Secondly, a minor consideration relates to our performance hypothesis. This time period allows us to apply the Fama and French (1993) three-factor model out-of-sample. Their empirically determined model was formed over the years 1963 to 1991. The three-factor model will enable us to determine the long-run performance of newly listed NYSE stocks during 1926 to 1962 using more recent benchmarks found in the literature.

We establish the predictive ability of the new listing variable in two ways. Granger causality tests and predictive OLS regressions show that the new listing variable is the only statistically significant predictor of future aggregate market returns. It has predictive power even in the presence of other predictors found in previous literature such as the short-term T-bill return, the term spread, the default spread, earnings/price ratios, and dividend yields. Our predictive regressions show that for each additional new listing, the expected future market return will decline by 75 basis points on average.

Prior literature examining new listings finds negative abnormal stock returns on average following listing [McConnell and Sanger (1987), Dharan and Ikenberry (1995), Webb (1999)].[3] Using a NYSE sample from 1926 to 1962, we document five-year buy-and-hold returns to newly listed firms of 44 percent, compared with a five-year return to an equally weighted market index of 59 percent. Once we control for market, size, and book-to-market with the Fama and French three-factor model though, we find

[3] McConnell and Sanger (1987) find widespread negative stock returns immediately following listing for their sample of new listings from 1926 through 1982. Dharan and Ikenberry (1995) document a negative drift in abnormal returns through 31 months after listing for a sample from 1962 to 1990.

no underperformance among new listings. This out-of-sample application of the three-factor model finds the model able to explain new listing stock returns.

While we find no evidence of managers timing their own firm's performance, we do give results consistent with the new listing variable having predictive ability for future market returns. In addition to the predictive regressions discussed previously, we also examine one-year pre- and post-listing market returns. We find the average one-year pre-listing market return is 23 percent while the average one-year post-listing market return is only six percent. These returns compare with an unconditional average one-year market return of 18 percent during 1926 to 1962. The difference in the unconditional and post-listing returns is an economically significant indicator of managers newly listing their firms before a market decline. Importantly, we also show that mean reversion in aggregate market returns is not responsible for the evidence supporting managerial timing of new listings.

Nonparametric regression and cross validation methods analyze the expected number of new listings per quarter as a function of the one-year post market return. These smoothing techniques show that the one-year post market return exhibits a decreasing trend as a function of the number of new listings per quarter. As the number of new listings per quarter increases, the expected one-year post market return decreases. In total, our preceding evidence strongly suggests that managers possess timing ability in choosing to newly list their firm's stock before aggregate market declines.

The paper is organized as follows. The first section describes managerial motives to list before market declines. The second section describes the methodology and data. The third section discusses the empirical results. The fourth section examines mean

reversion and the market-timing hypothesis. The fifth section determines the forecasting ability of the new listing variable. The last section concludes the paper by summarizing our findings.

Managerial Motivation to List before Market Declines

As listing is a voluntary action, one must consider what factors might motivate managers to list on a major exchange before market declines. It is apparent from reading newspaper and research journal articles covering new listings during our time period that NYSE listing requirements were generally stricter than those of regional exchanges.[4] Every year, the NYSE sets its minimum requirements for listing (e.g., requiring a certain level of operating income or market capitalization).

If the aggregate market and general economy are at a high level, a firm may be in a better position to meet the NYSE listing requirements. In particular, firms may have a higher probability of satisfying the minimum market value requirement. If the market goes into a decline, poor economic conditions might affect the operating performance of firms. Firms hit particularly hard may no longer meet the NYSE listing requirements and thus lose their chance to list on this exchange. An additional consideration is that requirements for continued listing eligibility on the NYSE are substantially lower than initial listing requirements. As such, firms may seize the chance to list when they meet the NYSE requirements and not risk losing that opportunity during a market decline.

[4] For example, Ule (1937) remarks that the NYSE was less likely than the New York Curb Exchange (currently American Stock Exchange) to accept over-the-counter stocks for listing. The NYSE preferred to accept only "seasoned" stocks that had first been listed on regional exchanges.

While the NYSE requires certain minimum listing guidelines, it also defines a set of subjective requirements for each listing decision. Particular attention is given to: the degree of national interest in the firm; its relative position and stability in the industry; and whether the firm is engaged in an expanding industry, with prospects of at least maintaining its relative position. These subjective requirements highlight the importance of listing before a market downturn. If the market declines, the NYSE may downgrade its view of the firm's industry position and the level of national interest in the company.

Once a firm meets the NYSE listing guidelines, it still may not choose to list on that exchange. In 2004, Microsoft and Intel easily meet the minimum NYSE listing requirements and yet are content to continue trading on Nasdaq. In 1934, the New York Times discussed Standard Oil of Indiana's (currently BP Amoco, PLC) decision to list on the NYSE in August of that year. The firm contemplated the move for two years before actually switching from the New York Curb Exchange to join four other Standard Oil companies already listed on the NYSE. Standard Oil of Indiana could easily have listed on the NYSE sooner. On its listing date in August 1934 it had the ninth largest market capitalization of any NYSE stock issue.

Aggarwal and Angel (1998) discuss reasons a firm may decide not to list on the NYSE even after meeting the listing requirements. Firms may not wish to agree to the current and future corporate governance rules of the NYSE. These rules govern selection of outside directors and also disclosure requirements. Additionally, the NYSE has historically been reluctant to allow share classes with different voting rights. Listing on the NYSE may also be quite expensive. The annual maintenance fees and fees charged per number of shares outstanding are substantially higher than exchanges such as Amex.

While a firm may already have met the minimum NYSE listing guidelines for several months, it may actually be the threat of an imminent market decline that pushes the firm to become a NYSE new listing.

Apart from meeting the NYSE listing requirements, there are other reasons firms may wish to list before market declines. Baker and Johnson (1990) cite the visibility and prestige of a major exchange as a primary listing motive. They argue that stocks on major exchanges receive more newspaper coverage and a larger analyst following. This increased visibility may improve the marketability of a firm's stock. Christie and Huang (1993) and Kadlec and McConnell (1994) examine the liquidity of major exchanges. Increased liquidity will also have a positive effect on marketing a firm's stock.

Firms may plan to use the increased marketability of a major exchange to subsequently issue equity or for insiders to sell their own shares. Accomplishing these events before a decline in the market is essential. In fact, Baker and Edelman (1992) document the mean number of days between the application announcement and the actual listing date as 22 days for a sample of firms switching from Amex to the NYSE. This short listing period may make it possible to accomplish the new listing and ensuing events before deterioration in the overall market.

Methodology and Data

The sample consists of 1,153 domestic operating firms (i.e., excluding American Depository Receipts, Real Estate Investment Trusts, and closed-end funds) that newly listed on the NYSE during January 1926 to June 1962. The stock returns are obtained from the Center for Research in Security Prices (CRSP) monthly tape, which begins in

December of 1925. June of 1962 is selected as the ending point for data collection because of the American Stock Exchange inception on the CRSP tapes in July of 1962. Thus, our sample includes the entire universe of newly listed firms on the NYSE before Amex firms are included on the CRSP monthly tape. No requirement of length of time on the CRSP tapes is imposed on the sample.

Buy-and-hold returns are calculated for the 60 months (five years) following the new listing. If a firm delists from the NYSE before the five-year anniversary of the initial listing, the buy-and-hold returns end on the CRSP delisting date of that particular firm. We employ two benchmarks to measure the subsequent stock performance. First, buy-and-hold returns for the equally weighted monthly CRSP NYSE index are constructed over an identical time period as the newly listed sample firm. If the newly listed firm is removed from the NYSE before completion of the 60-month sample period, the buy-and-hold returns for the index also end on the firm's CRSP delisting date.

The use of the equally weighted index is somewhat problematic. Although the typical newly listed firm falls within the middle market capitalization deciles of the NYSE, the equally weighted index may not be the proper benchmark for measuring abnormal stock performance. On average, newly listed firms may be tilted toward growth firms (i.e., low book-to-market ratio). In fact, Dharan and Ikenberry (1995) confirm that over half their new listing sample from 1962 to 1990 can be classified as growth firms. Jaffe, Keim, and Westerfield (1989), Fama and French (1992), Lakonishok, Shleifer, and Vishny (1994), and Davis, Fama, and French (2000) have presented evidence that growth firms generally have lower subsequent returns than the market. Comparing a sample of growth firms to the market index should find poor

subsequent performance for the sample. However, this poor performance may simply result from the characteristics of the sample.

To address this concern, the second benchmark tests for abnormal performance with the Fama and French (1993) three-factor model. Fama and French report that market (beta), size (SMB), and book-to-market (HML) account for more than 90 percent of the variation in cross-sectional returns. Their time series of factor realizations begins in July of 1927. For these regressions, the dependent variables include both the equally weighted and value-weighted portfolio returns.

The use of the three-factor model during our time period has several advantages. First, the model allows for easy statistical interpretation of the intercepts (see Barber and Lyon (1997) and Kothari and Warner (1997) for a discussion of buy-and-hold return detection problems). Second, since Compustat book values are not available prior to 1963, a book-to-market matching procedure for our sample is virtually impossible (i.e., pairing our sample firms with similar book-to-market firms to gauge abnormal performance). Hence, the three-factor regressions allow us to determine abnormal performance without having to hand-collect thousands of book values.

Benchmark contamination is one potential problem with the use of the three-factor model. Loughran and Ritter (2000) recommend purging the benchmark of the sample firms. Their argument is that a test is biased towards finding no abnormal returns if it uses a benchmark that is contaminated with many of the firms that are the subject of the test. Because consistent Compustat book values are not available, we are unable to purge the newly listed sample from the size and book-to-market factors.

Empirical Findings

A. Stock Performance of Newly Listed NYSE Firms

Panel A of Table 1 reports the number of newly listed firms each cohort year, the five-year buy-and-hold returns for the sample and the equally weighted index, wealth relatives, and the median initial listing stock price. Cohort year 1929 had the highest number of new listings (111) compared to only two for the depression year of 1932. During the 37 year period, a steady flow of firms typically listed on the NYSE from either the Curb Exchange (i.e., as Amex was known before 1953), a regional exchange (e.g., Boston Stock Exchange), or a few as initial public offerings. For example, in 1934 Standard Oil of Indiana switched from the Curb Exchange to the NYSE at an initial price of about $27. That same year, Boeing Company changed their listing from the San Francisco Curb Exchange to the NYSE at a first price of approximately $8. The last column of Panel A reports that the median initial stock price is over $27.

Consistent with the previous literature, we find some evidence of poor subsequent performance of newly listed NYSE firms. The average five-year buy-and-hold returns for the sample firms of 44 percent are substantially less than the average index return of 59 percent.[5] The wealth relative for the sample of 0.91 implies that investors in the new listings portfolio would earn 91 cents for every $1.00 earned by the index. The wealth relative is defined as the average gross stock returns of the sample divided by the average gross returns for the equally weighted index.

[5] Examining three-year buy-and-hold returns, we still find significant underperformance of the new listings portfolio. Dharan and Ikenberry (1995) find negative cumulative abnormal returns to new listings through 36 months. However, examining six-month intervals, they claim that the negative drift in post-listing returns is generally absent beyond 36 months.

Panel B of Table 1 lists the proportion of newly listed firms within the NYSE market capitalization size deciles and the stock performance. Each December (1925 to 1961), all NYSE firms are ranked by their market capitalization (stock price multiplied by shares outstanding). The yearly rankings are used to create annual size deciles. As the panel indicates, the typical firm in our sample is a mid-sized NYSE firm. Almost three-quarters of our sample fall within size deciles three to seven. Less than two percent of the sample falls within the smallest NYSE size decile.

The poor performance of newly listed NYSE stocks is not clustered in one size decile, as shown in Panel B of Table 1. Eight of the ten size deciles have wealth relatives less than one. The smallest size decile has the best subsequent performance, yet the decile contains a small percentage of the total sample.

B. Fama and French Three-Factor Regressions

Up to this point we have confirmed the evidence presented in prior literature that a new listings portfolio exhibits long-run underperformance when compared with a market index. Next, we move to Table 2 which reports the results of three-factor regressions to examine whether the results are robust to the three-factor (i.e., beta, size, and book-to-market) methodology. For completeness sake, all regressions use both an equally and value-weighted portfolio as the dependent variable. The portfolio returns (i.e. dependent variable) include all firms listing on the NYSE within the last 60 months. After subtracting the risk-free rate from the portfolio returns, the returns are regressed across the three factors.

The regression results using 432 months of data are given in Panel A of Table 2. Row one contains the results using the equally weighted portfolio as the dependent

variable. The coefficients on market, SMB (small minus big) and HML (high minus low) are all statistically significant. The intercept is not statistically different from zero. The intercept of 0.05 implies five basis points per month of abnormal performance that cannot be explained by the market, size, and book-to-market factors. As is common in the three-factor regressions, the adjusted R-squared is quite high (0.97). In row two of Panel A, the value-weighted portfolio return also has an insignificant intercept of -0.02.

In Panel B of Table 2, we divide the sample into two sub-periods in order to test the robustness of the regression results in Panel A. It is possible that the new listings sample exhibits structural differences over the course of our sample period. The end of World War II (1945) is arbitrarily used as the dividing point. Once again, in all four of the regressions, the intercepts are never statistically different from zero. The intercept values range from -0.08 (t-statistic of -0.62) to 0.19 (t-statistic of 1.40). The three factors explain the limited underperformance documented in the previous literature and reported in Table 1.

C. The Timing Ability of Newly Listed NYSE Firms

At this point, our paper reads like a sub-section from Fama and French (1996). That is, the three-factor model can "explain" a previously documented anomaly. One might argue that the new listing effect merely is a characteristics effect that the combination of the beta, size, and book-to-market factors completely explains. Low intercepts on both the equally and value-weighted regressions indicate that the new listing effect contains nothing more than what is contributed by the three factors.

Although the newly listed NYSE firms do not underperform beyond what is explained by the three-factor model, listing firms still may have a timing ability relating

to *aggregate market* movements. That is, firms may decide to list on the NYSE prior to a general market decline for many possible reasons, as outlined in the first section. One potential motivation is the uncertainty of meeting the exchange's listing requirements if market and economic conditions were to decline. Other motivators include the possible desire to issue equity immediately following new listing and the increased liquidity a major exchange might bring the firm's stock (as compared to a regional exchange), especially in periods of market decline.

We conduct several tests to examine managerial timing ability. First, note the functional relation between the number of new listings per quarter and the subsequent one-year post market return shown in Figure 1. New listings are grouped by quarter in order to reduce noise in the series. The chart gives the number of new listings per quarter in the bar graph and one-year post market returns for each quarter in a line graph. The monthly value-weighted NYSE stock index given in the Fama-French time series of factors is used to calculate one-year post market returns for each quarter from July 1927 to June 1962.

A general relationship emerges from the two series. The number of new listings per quarter appears negatively related to market declines. When the number of new listings per quarter is relatively high, the one-year post market return for that same quarter is often low. The darkly shaded bars correspond to the National Bureau of Economic Research (NBER) classified recessions in the U.S. (The recession data is available from the NBER website (www.nber.org)). It is interesting to note that the recession periods also often appear after quarters when the number of new listings is higher than usual.

We examine pre- and post-listing market returns in Table 3. The table reports the equally weighted CRSP index performance for the 12-month period prior to and following each new listing. Since CRSP begins reporting index returns in January of 1926, the 57 firms from that cohort year do not have a complete prior 12-month window. Hence, the prior market return for firms in the 1926 cohort year are given a missing value. The table reports evidence consistent with market timing ability by firms. For the aggregate sample, the average prior year return is 23 percent compared to only six percent for the 12 months following the new listings. These pre- and post-listing returns should be compared with the one-year unconditional equally weighted CRSP NYSE index return of 18 percent over the same time period. The difference of 12 percent between the unconditional average market return and the post return appears quite economically significant.

Table 3 categorizes the data into pre- and post-World War II sub-periods. Although there is a greater difference between the unconditional and post-listing market performance for the earlier period, the timing ability appears strong in both periods. Pre-1945, the unconditional return is 19 percent and the one-year post-listing return is four percent. The post-1945 period shows an unconditional return of 16 percent and an one-year post-listing return of nine percent.

Next, Table 4 outlines the performance of new listings during hot and cold markets. Previous literature has examined hot and cold markets in regards to other corporate events such as IPOs [Ibbotson and Jaffe (1975), Ritter (1984)]. Three-factor regressions are conducted after dividing the sample in two, according to the median number (133) of new listings in the dependent variable monthly returns portfolio. When

the number of new listings in the return portfolio is *less* than its median (i.e. a cold market), we find no underperformance using the three-factor model, as shown in Panel A. In contrast, in the value-weighted regressions for a hot market, statistically significant underperformance for the new listings portfolio exists. As given in Panel B, while the intercept from the equally weighted regression in this case is not significant, the intercept from the value-weighted regression equals -0.24 with a t-statistic of -2.48.

D. Nonparametric Regression

Although Figure 1 suggests a general relationship between the number of new listings per quarter and the subsequent one-year post market return, a more concrete measure of this relation is needed. The analysis used here is nonparametric regression as outlined in Hardle (1990). The regression relationship is modeled as:

$$Y_i = m(X_i) + \varepsilon_i , \qquad i = 1,\ldots, n, \qquad (1)$$

where m is the unknown regression function and ε_i are the observation errors. Neither the error distribution, nor the functional form of the mean function is specified [for example, ordinary least squares assumes a mean regression function that is linear in the parameters and it may also assume an error distribution that is $N(0, \sigma^2)$]. Nonparametric regression is a smoothing or local averaging technique that provides a versatile method of exploring a general relationship between two variables. The estimated function can be defined as:

$$\hat{m}(x) = n^{-1}\sum_{i=1}^{n} W_{ni}(x)Y_i \qquad (2)$$

where $W_{ni}(x)$ denotes a sequence of weights which may depend on the whole vector X_i. The weight function is influenced by choice of a bandwidth and a kernel function [see Hardle (1990) for details].

Nonparametric regression is consistent *regardless* of the shape of the true curve. A pre-selected parametric model might be too restrictive or too low-dimensional to fit unexpected features of the data. This could lead to model misspecification and possibly misleading results. The sample size of quarterly data used for this regression is 136 data points. The bandwidth for the regression is carefully chosen according to the cross-validation method also outlined in Hardle (1990). Alternative bandwidths are analyzed to verify the robustness of the regression function. A gaussian kernel function is used.

Figure 2 gives the functional relation between the number of new listings per quarter and the one-year prior market return for that quarter, as determined by nonparametric regression. A 95 percent confidence interval is also shown with the regression function. We see a strong monotonic relation between the number of new listings and the one-year prior market return, for ranges of -60 percent to approximately 50 percent. Once the market return is greater than 50 percent the increasing relation subsides. However, care should be taken in interpreting the regression function results beyond a market return of 50 percent as only seven data points are available to use in the regression beyond that point. The confidence intervals in this area also document the uncertainty with the regression as they widen considerably.

Of greater interest in terms of establishing managers' timing ability is the nonparametric regression shown in Figure 3. A 95 percent confidence interval is included with the regression. The graph shows an almost everywhere-decreasing functional relationship between the number of new listings per quarter and the one-year post market return for the corresponding quarter. As the number of new listings

increases, the one-year post market return decreases. Again, the confidence intervals widen considerably once the number of new listings per quarter reaches 26 as there are only four data points in that outer region.

The majority of the expected one-year post market return function exhibits a clear decreasing trend as the number of new listings increases. This fact makes us comfortable examining a linear relationship between post market returns and the new listing variable in predictive regressions examined later in the paper. Both Figures 2 and 3 signal linear trends in the relationships. Another way to look at the nonparametric regression in Figure 3 is to note that it is not possible to fit an *increasing* function inside the confidence interval. In total, the preceding evidence strongly implies that managers attempt to time their new listings to occur before market declines.

Mean Reversion and Market Timing

While the tests of the preceding section point to managers possessing timing ability in choosing when to list their stocks on the NYSE, alternative explanations must be considered. Recall that the average one-year prior market return for new listings was 23 percent while the average one-year post market return was only six percent. It may be argued that the difference in returns is simply due to mean reversion in the market return. The aggregate market first experiences a period of overreaction to market events followed by a correction where the market return drops to its 'conventional' level.

A simple first test to detect mean reversion shows that the correlation between the one-year prior market return series and the one-year post market return series is only

0.05. If mean reversion is the reason for the difference in market returns, a strong negative correlation between the two series would be expected.

Additionally, if mean reversion is present in the series, one would expect to see the largest prior market returns being followed by the smallest post market returns, and vice versa. Table 5 shows the results of Kruskal-Wallis tests for determining whether the distribution of a variable is the same across different groups. The null hypothesis is that after forming groups according to the one-year *prior* market returns, there will be no difference in means of the one-year *post* market returns. If mean reversion is present in the series, the Kruskal-Wallis tests should reject this null hypothesis.

In Table 5, the one-year prior market return is classified into five groups, from smallest prior returns in group one to largest prior returns in group five. The number of observations in each group is given, with differences in the number occurring because of "ties" in the value of the one-year prior market return. The mean of the one-year post market return is also shown, according to the prior return quintiles. One would expect to see larger means for the one-year post market returns of group one and smaller means for group five if mean reversion is present in aggregate market returns. This is not the case with the largest average post market return actually occurring for group two (16 percent). Additionally, the means for group one (five percent), group four (seven percent) and group five (four percent) are quite similar. However, according to the p-value of 0.0001, the null hypothesis of no difference in means of the one-year post market return variable is rejected.

But consider only the low and high groupings from Table 5. The Kruskal-Wallis test is conducted for only these two groups. The p-value of 0.7670 implies that the null

hypothesis of no difference in means of the one-year post market return variable *cannot* be rejected. The test results establishing market timing of newly listed NYSE firms do not appear to be an artifact of mean reversion in aggregate market returns.

Forecasting Ability of the New Listing Variable

Previously, we presented evidence that suggests managers are able to time their new listing decision in relation to aggregate market returns. If managers do possess this ability, then the new listing variable might have predictive power for market returns. From an investment viewpoint, determining variables that provide information about future market returns is potentially quite valuable. Thus, in this section we determine the forecasting ability of the new listing variable for future aggregate market returns.

We look at forecasting ability in two ways. First, we conduct granger causality tests to determine if the new listing variable provides information about future market returns above and beyond the information contained in past market returns. In general, granger causality tests tell you whether a variable *x* can help forecast another variable *y*; they do not tell you if a variable *x causes* a variable *y*.

The test is structured as the following regression:

$$R_{m,t+1} = a + bR_{m,t} + cR_{m,t-1} + dNL_t + eNL_{t-1} + \varepsilon_t \qquad (3)$$

where $R_{m,t}$ is the value-weighted market return from the Fama-French time series of factors and NL_t is either the number of new NYSE listings or the percentage of new NYSE listings (as a portion of all firms on the NYSE at time t). The market returns and the new listing variables are cumulated into non-overlapping six-month intervals from the

second half of 1927 to the first half of 1961, for a total of 69 observations. The null hypothesis is that d = e = 0.

Table 6, Panel A gives the results of the granger causality tests using both the number and the percentage of NYSE new listings variables. Both the F-test and the χ^2-test reject the null hypothesis. The results shown are for tests using two lags, but varying the number of lags used from one to four does not alter the findings. It appears the new listing variable has predictive power for future market returns beyond the information contained in past market returns.

Next, we conduct predictive OLS regressions by putting the new listing variable in competition with other variables that may have predictive power for future returns. Prior research has claimed that the short-term interest rate, the term spread, the default spread, the dividend yield and the earnings/price ratio have forecast ability for aggregate market returns [see Kothari and Shanken (1997), Fama and French (1988), Fama and Schwert (1977), and Keim and Stambaugh (1986)].

The regression is modeled as:

$$R_{m,t+1} = a + bR_{m,t} + cNL_t + dRATE_t + eTERM_t + f\,DEF_t + gEP_t + hDP_t + \varepsilon_t \qquad (3)$$

where $R_{m,t}$ and NL_t are as in the previous regression, $RATE_t$ is the T-bill return, $TERM_t$ is the term spread on long-term government bonds over the short-term T-bill rate, DEF_t is the default spread on long-term corporate bonds over long-term government bonds, EP_t is the earnings/price ratio for the Dow Jones Industrials (DJI), and DP_t is the dividend/price ratio for the DJI. All of the variables are cumulated into six-month intervals. As the earnings/price ratio and the dividend yield for the DJI are only available starting in the second half of 1929, all the data are truncated to this date, resulting in 65 observations.

The T-bill return, term spread and default spread are from *Stocks, Bonds, Bills, and Inflation*. The earnings/price ratio and the dividend yield are from *Moody's Industrial Manual*.

Table 6, Panel B shows the results of the predictive regressions. Only the new listing variable (whether in the number or percentage form) provides statistically significant information regarding future market returns. The regressions show economic significance of the new listing variable as well. The coefficient of -0.75 on the number of new listings variable indicates that for every additional new listing, the future six-month market return will be reduced by 75 basis points. It appears the new listing variable provides valuable forecasting information for aggregate market returns.

Conclusion

This paper establishes that the number of new listings on the NYSE during 1926 to 1962 has predictive power for future aggregate market returns. The forecasting ability of the new listing variable is evident even in competition with other standard predictors, such as the dividend yield, that are found in the finance literature. Controlling for market, size and book-to-market through the Fama and French model eliminates the new listing effect. We do, however, establish the aggregate market timing ability of managers choosing to newly list during our sample period. While new listings do not underperform in the long run, firms appear to time their new listings to occur before market declines.

We show this timing by examining one-year pre- and post-listing returns. One-year pre-listing market returns are 23 percent, while one-year post-listing market returns are only six percent. The economic significance of our timing results is apparent

when comparing the post return of six percent with the unconditional mean during this time period of 18 percent. Nonparametric regression documents the decreasing trend between the number of new listings per quarter and the one-year post market return for that quarter. Finally, mean reversion in aggregate market returns is not responsible for the evidence supporting managerial timing of new listings.

We provide several reasons managers would desire to newly list their stock before a market decline. The cumulative evidence we present strongly suggests managers possess timing ability in choosing when to newly list their stock. Each of our tests for market timing points to firm managers trying to synchronize their new listings on the NYSE to occur *before* the aggregate market moves downward.

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Table 1. The Long-Run Performance of New Listings by Cohort Year and by Size Decile, 1926 to 1962

The sample consists of 1,153 firms that were newly listed on the NYSE during January 1926 to June 1962. Stock return information is collected from the CRSP monthly tape. All returns are buy-and-hold returns. The index return is the CRSP NYSE equally weighted (EW) index. Wealth relatives are computed as $[(1 + R_{iT}) / (1 + R_{mT})]$, where R_{iT} is the holding-period return from the first CRSP-listed closing price until the earlier of the delisting date or the five-year anniversary of the new listing, R_{mT} is the holding-period return for the index over the same holding period, and the summations are over the N observations in a cohort year. For example, 1926's wealth relative of 1.12 is computed as 1.0812 / 0.9633, with 1.0812 as the terminal wealth per dollar invested after having gained 8.12 percent on the new listings portfolio.

Panel A: By Cohort Year, 5-Year Buy-and-Hold Returns, Wealth Relatives and Price

Cohort Year	Number of New Listings	5-Year New Listings Returns (%)	5-Year EW Market Index Returns (%)	Wealth Relative	Median Stock Price ($)
1926	57	8.12	-3.67	1.12	36.75
1927	59	-9.16	-30.71	1.31	48.00
1928	57	-57.70	-35.17	0.65	54.63
1929	111	-62.00	-24.62	0.50	50.00
1930	41	-50.25	-4.56	0.52	32.38
1931	14	138.54	298.80	0.60	19.50
1932	2	473.66	540.24	0.90	9.25
1933	13	65.62	66.58	0.99	14.00
1934	8	74.12	80.04	0.97	19.06
1935	29	26.68	43.50	0.88	19.50
1936	40	-18.54	-12.77	0.93	30.31
1937	45	-19.95	-19.24	0.99	24.38
1938	12	111.54	125.68	0.94	15.06
1939	18	80.83	156.99	0.70	18.31
1940	21	112.49	265.02	0.58	19.13
1941	14	336.14	371.58	0.92	15.28
1942	8	198.83	277.12	0.79	12.75
1943	20	98.66	120.99	0.90	14.72
1944	27	67.37	78.50	0.94	17.63
1945	31	43.97	56.05	0.92	24.00
1946	57	33.83	55.71	0.86	24.50
1947	38	96.00	99.64	0.98	18.06
1948	26	110.86	99.80	1.06	16.13
1949	28	138.46	142.11	0.98	14.47
1950	28	132.11	162.29	0.88	21.81
1951	24	170.43	121.97	1.22	24.50
1952	19	134.27	98.71	1.18	22.63
1953	17	111.77	112.34	1.00	18.88

1954	16	105.83	120.42	0.93	27.25
1955	27	69.89	69.35	1.00	27.38
1956	22	122.74	82.59	1.22	25.75
1957	42	60.17	68.64	0.95	30.44
1958	17	74.33	72.38	1.01	23.50
1959	38	32.85	42.63	0.93	33.25
1960	53	55.63	70.49	0.91	25.00
1961	50	47.41	60.42	0.92	34.19
1962	24	90.03	91.13	0.99	23.00
1926-62	1,153	44.36	59.32	0.91	27.13

Panel B: By Size Decile, 5-Year Buy-and-Hold Returns and Wealth Relatives

NYSE Size Decile	Portion of Total Sample (%)	5-Year New Listings Returns (%)	5-Year EW Market Index Returns (%)	5-Year Wealth Relative
Small	1.99	118.99	71.60	1.28
2	5.98	53.23	68.65	0.91
3	12.66	56.62	71.28	0.91
4	16.22	42.29	44.07	0.99
5	16.05	31.09	60.24	0.82
6	15.61	36.74	54.64	0.88
7	12.32	42.80	70.56	0.84
8	7.72	38.80	62.16	0.86
9	7.81	58.54	54.21	1.03
Large	3.64	33.12	46.43	0.91
Average		44.36	59.32	0.91

Table 2. Time-Series Regressions of Equally Weighted and Value-Weighted Monthly Percentage Returns on a Portfolio of New Listings with Market, Size and Book-to-Market as Explanatory Variables

The sample consists of 1,153 firms that were newly listed on the NYSE during July 1927 to June 1962 (432 months). Stock return information is collected from the CRSP monthly tape. The first row of each panel uses equally weighted monthly returns and the second row uses value-weighted monthly returns. R_{pt} is the new listings portfolio return in month t; R_{mt} is the return on the VW index of NYSE stocks in month t; R_{ft} is the beginning-of-month three-month T-bill yield in month t; SMB_t is the return on small firms minus the return on large firms in month t; and HML_t is the return on high book-to-market stocks minus the return on low book-to-market stocks in month t. The factor definitions are given in Fama and French's 1993 paper on pages 8-10. All t-statistics are heteroskedasticity-consistent and are given in parentheses.

$$R_{pt} - R_{ft} = a + b[R_{mt} - R_{ft}] + sSMB_t + hHML_t + e_t$$

Panel A: All months from July1927 to June 1962 (432 months)

	a	b	s	h	Adjusted R^2
Equally-Weighted	0.05 (0.73)	1.08 (78.43)	0.79 (36.30)	0.25 (10.04)	0.97
Value-Weighted	-0.02 (-0.22)	0.99 (69.93)	0.21 (9.28)	-0.07 (-2.85)	0.94

Panel B: Sample divided into two sub-periods, July 1927 to December 1945 (Pre-1945) and January 1946 to June 1962 (Post-1945)

	a	b	s	h	Adjusted R^2
Pre-1945					
Equally Weighted	0.19 (1.40)	1.07 (51.39)	0.78 (25.52)	0.30 (8.10)	0.97
Value-Weighted	-0.08 (-0.62)	0.97 (51.82)	0.19 (6.74)	-0.03 (-0.90)	0.96
Post-1945					
Equally Weighted	-0.04 (-0.75)	1.10 (77.18)	0.79 (26.79)	0.07 (2.60)	0.97
Value-Weighted	0.06 (0.63)	1.05 (43.69)	0.37 (7.48)	-0.14 (-3.16)	0.91

Table 3. Pre- and Post-New Listing Market Returns By Sub-Period

The sample consists of 1,153 firms that were newly listed on the NYSE during January 1926 to June 1962. Stock return information is collected from the CRSP monthly tape. The index returns are one-year returns pre- and post-listing. The index return is the CRSP NYSE equally weighted (EW) index. CRSP began reporting index returns in January 1926, so the 57 firms from that cohort year do not have a 12-month prior return window. Wealth relatives are computed as $[(1 + R_{iT}) / (1 + R_{mT})]$, where R_{iT} is the holding-period return from the first CRSP-listed closing price until the earlier of the delisting date or the five-year anniversary of the new listing, R_{mT} is the holding-period return for the index over the same holding period, and the summations are over the N observations in a price range. The unconditional average 1-year market return is calculated from the CRSP NYSE EW index during the given time periods.

Sample divided into two sub-periods, Market Performance for 1-Year Pre- and Post-New Listing

Sub-Period	Number of New Listings	1-Year Pre-Listing Market Return (%)	1-Year Post-Listing Market Return (%)	Unconditional Mean Market Return (%)
Pre-1945	627	28.02	4.39	19.09
Post-1945	526	17.62	8.91	16.23
All Firms	1,153	23.03	6.46	17.70

Table 4. Time-Series Regressions in Hot and Cold Markets

The sample consists of 1,153 firms that were newly listed on the NYSE during July 1927 to June 1962 (432 months). Stock return information is collected from the CRSP monthly tape. The sample is divided in two according to the median number (133) of new listings in the dependent variable monthly returns portfolio. The first row of each panel uses equally weighted (EW) monthly returns and the second row uses value-weighted (VW) monthly returns. R_{pt} is the new listings portfolio return in month t; R_{mt} is the return on the VW index of NYSE stocks in month t; R_{ft} is the beginning-of-month three-month T-bill yield in month t; SMB_t is the return on small firms minus the return on large firms in month t; and HML_t is the return on high book-to-market stocks minus the return on low book-to-market stocks in month t. The factor definitions are given in Fama and French's 1993 paper on pages 8-10. All t-statistics are heteroskedasticity-consistent and are given in parentheses.

$$R_{pt} - R_{ft} = a + b[R_{mt} - R_{ft}] + sSMB_t + hHML_t + e_t$$

Panel A: Dependent variable contains all months where the number of new listings in the return portfolio is *less* than its median ("cold" market)

	a	b	s	h	Adjusted R^2
Equally Weighted	0.08 (0.77)	1.06 (42.05)	0.66 (16.93)	0.16 (3.63)	0.94
Value-Weighted	0.16 (1.30)	0.99 (32.00)	0.24 (4.91)	0.03 (0.50)	0.87

Panel B: Dependent variable contains all months where the number of new listings in the return portfolio is *greater* than its median ("hot" market)

	a	b	s	h	Adjusted R^2
Equally Weighted	0.14 (1.26)	1.08 (65.36)	0.84 (32.11)	0.29 (9.55)	0.98
Value-Weighted	-0.24 (-2.48)	1.00 (67.15)	0.19 (8.26)	-0.11 (-4.07)	0.97

Table 5. Tests for Difference in 1-Year Post Market Return Means, Grouped According to 1-Year Prior Market Returns

The sample consists of 1,153 firms that were newly listed on the NYSE during January 1926 to June 1962. Stock return information is collected from the CRSP monthly tape. The index returns are one-year returns pre- and post-listing. The index return is the CRSP NYSE equally weighted index. The Kruskal-Wallis test determines if the distribution of a variable is the same across different groupings. The null hypothesis is that there is no difference in means. When only the low and high groups are considered, the p-value is 0.7670.

Prior Return Group	Number of Prior Returns	Mean 1-Year Prior Market Return	Mean 1-Year Post Market Return	Kruskal-Wallis Test p-value
Low	232	-17.95	5.10	0.0001
2	230	2.94	15.96	
3	234	20.34	0.65	
4	231	35.93	6.75	
High	226	68.55	3.88	
All Groups	1,153	23.03	6.46	

Table 6. The Forecasting Ability of the New Listing Variable as determined by Granger Casuality Tests and OLS Regressions

The sample consists of 1,153 firms that were newly listed on the NYSE during July 1927 to June 1962. Stock return information is collected from the CRSP monthly tape. Each variable is cumulated into six-month intervals. $R_{m,t}$ is the value-weighted market return from the Fama-French time series of factors. NL_t is either the total number of new listings on the NYSE or the percentage of new NYSE listings (out of the total number of firms on the NYSE at time t). $RATE_t$ is the T-bill return. $TERM_t$ is the term spread on long-term government bonds over the short-term T-bill rate. DEF_t is the default spread on long-term corporate bonds over long-term government bonds. EP_t is the earnings/price ratio for the Dow Jones Industrials (DJI). DP_t is the dividend/price ratio for the DJI. All t-statistics are heteroskedasticity-consistent and are reported in parentheses.

Panel A: Granger causality tests (at two lags) for the predictive ability of the new listing variable. The null hypothesis is that d = e = 0.

$$R_{m,t+1} = a + bR_{m,t} + cR_{m,t-1} + dNL_t + eNL_{t-1} + \varepsilon_t$$

New Listing Variable (NL)	Prob > F	Prob > χ^2
Number of New Listings	0.023	0.002
Percentage of New Listings	0.028	0.002

Panel B: OLS regressions of the predictive ability of the new listing variable in competition with other possible market return predictors.

$$R_{m,t+1} = a + bR_{m,t} + cNL_t + dRATE_t + eTERM_t + f\,DEF_t + gEP_t + hDP_t + \varepsilon_t$$

NL	a	b	c	d	e	f	g	h
Number	22.48 (1.96)	0.10 (0.48)	-0.75 (-4.17)	2.87 (0.92)	1.44 (1.84)	-1.87 (-1.67)	0.55 (0.22)	-4.56 (-0.72)
Percent	18.96 (1.72)	0.11 (0.55)	-4.17 (-3.98)	1.19 (0.37)	1.49 (1.92)	-1.89 (-1.68)	0.07 (0.03)	-3.41 (-0.55)

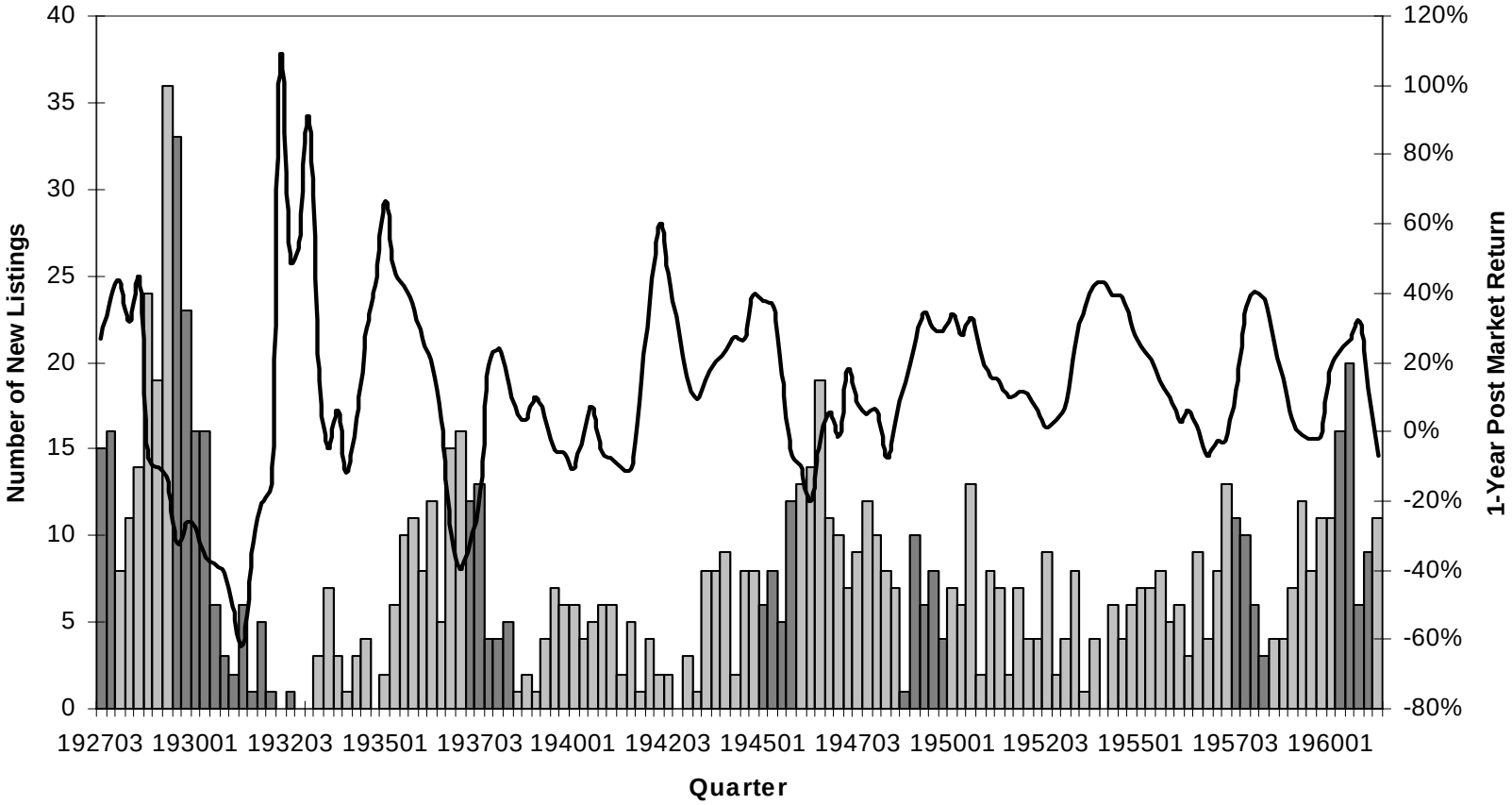

Figure 1: **Time series of new listings and 1-year post market returns.** The bar graph denotes the number of new listings per quarter. The quarter labeled 192703 corresponds to the third quarter in the year 1927. The line graph shows the 1-year post market return for the given quarter. The market returns are the value-weighted market returns from the Fama-French time series of factors. The dark bars correspond to periods of NBER classified recessions in the U.S.

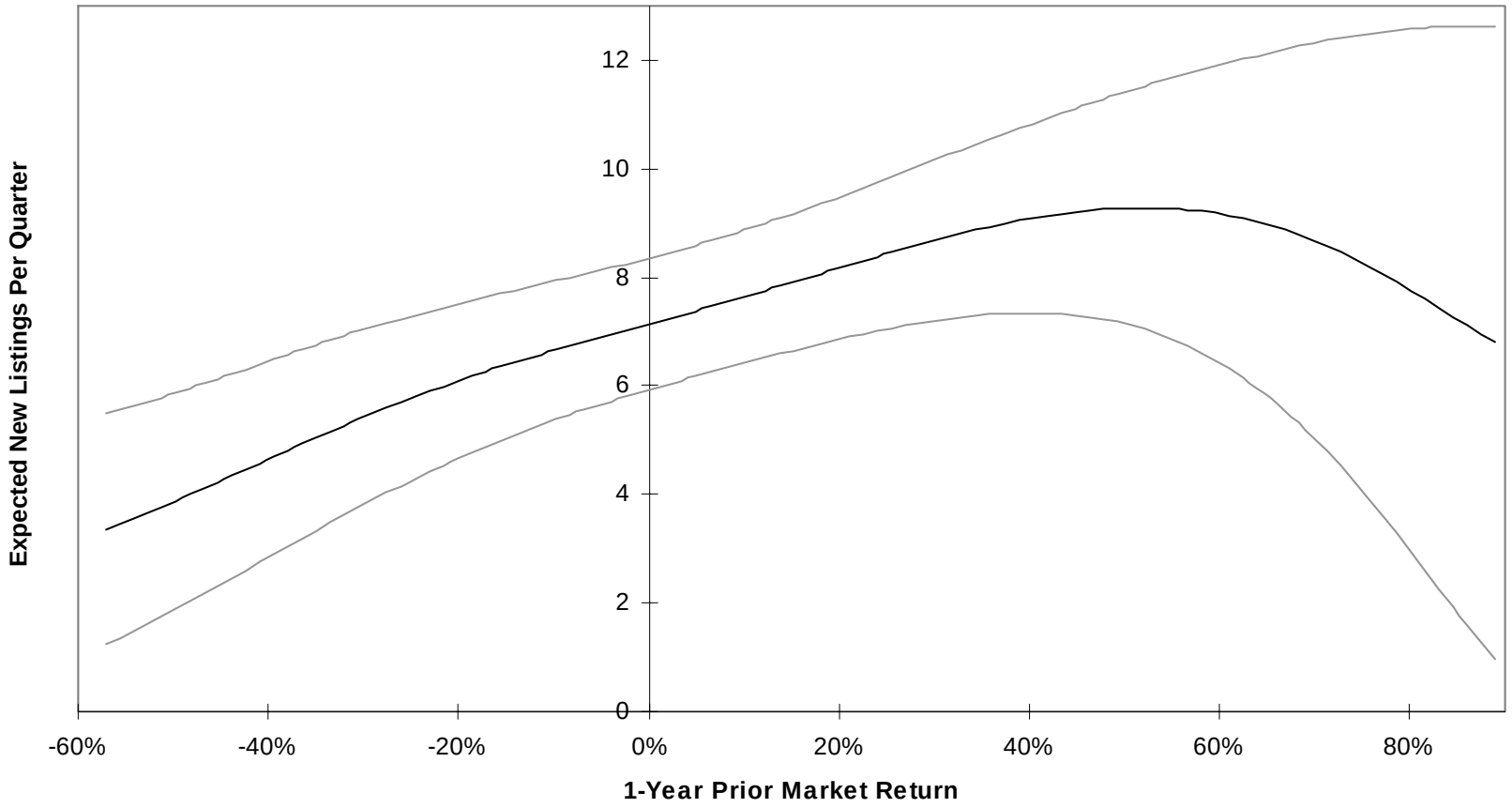

Figure 2: **Nonparametric regression linking the 1-year prior market return with the number of new listings.** The regression shows the expected number of new listings per quarter as a function of the 1-year prior market return for the corresponding quarter. The data for the number of new listings comes from a sample of 1,153 firms that were newly listed on the NYSE during January 1926 to June 1962. The market returns are from the value-weighted returns in the Fama-French time series of factors. The number of data points used in the regression is 136.

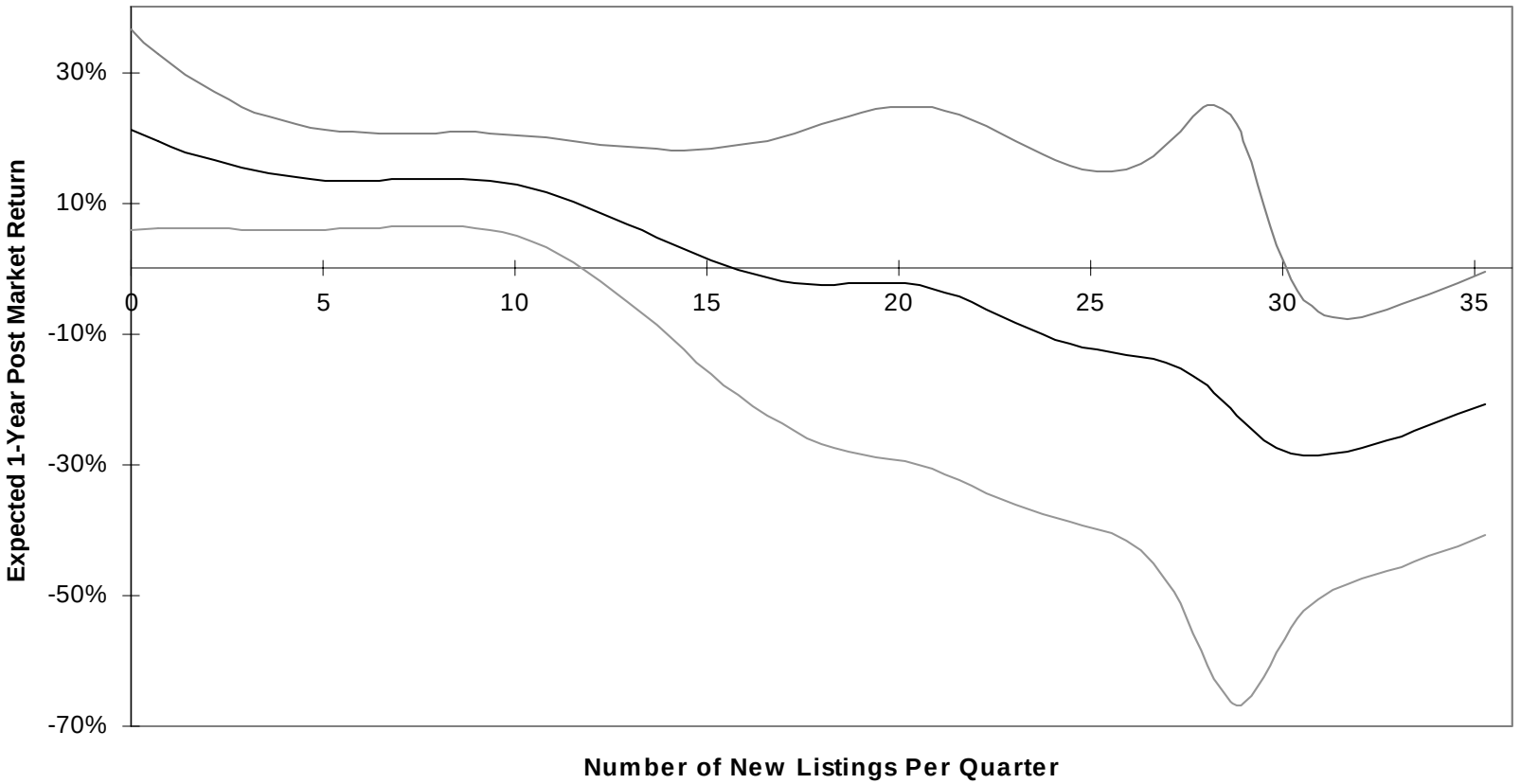

Figure 3: **Nonparametric regression linking new listings and 1-year post market return.** The regression shows the expected 1-year post market return as a function of the number of new listings for the corresponding quarter. The data for the number of new listings comes from a sample of 1,153 firms that were newly listed on the NYSE during January 1926 to June 1962. The market returns are from the value-weighted returns in the Fama-French time series of factors. The number of data points used in the regression is 136.